Appendix 1

Single Site Reports

Part 6
Tamaki Strait

Explanatory notes

This appendix provides a summary of the sediment chemistry and particle size distribution data for each monitoring site. The appendix has been divided according to "Marine Reporting Areas" (MRAs):

- Part 1: Central Waitemata Harbour
- Part 2: Upper Waitemata Harbour
- Part 3: East Coast Bays
- Part 4: Hibiscus Coast
- Part 5: Tamaki Estuary
- Part 6: Tamaki Strait
- Part 7: Manukau Harbour

The summaries are given as "Single Site Reports" (SSRs), in which the key physical and chemistry data are provided in 2 pages:

1. The first page provides a brief description of the site: its location; classification in terms of sediment and contaminant transport/accumulation – "Settling Zone" (SZ) or "Outer Zone" (OZ), as described in ARC Technical Publication TP 170 (ARC 2002); key physical characteristics; notable features and relevant monitoring information (e.g. location of nearby sites).
2. The second page gives a summary of the sediment contaminant and sediment texture data: results from each year of monitoring for Cu, Pb, Zn, "high molecular weight" PAH (HWPAH), total organic carbon (TOC), and "mud content" (defined below). The contaminant results have been compared with sediment quality guidelines (the ARC "Environmental Response Criteria", ERC). Indicative trends over time (see below), and a brief interpretative summary on key features of the data, have also been given.

Plots and summary statistics include all data reported to end of 2010, unless otherwise stated (e.g. occasional clear outlier removed before plotting & analysis). Where replicate analyses have been performed, data have been summarised as medians.

Trend data given in the SSRs have been determined by linear regression. The trend plots have been fitted with a quadratic curve "line of best fit" as an aid for visually assessing the nature of changes over time in the data series. Trend indicators, using "arrow" symbols, have been used to show the magnitude and direction of trends. No statistical significance associated with these trends is given (this is discussed in detail in the body of the Status and Trends Report). The trend indicators should be interpreted as follows:

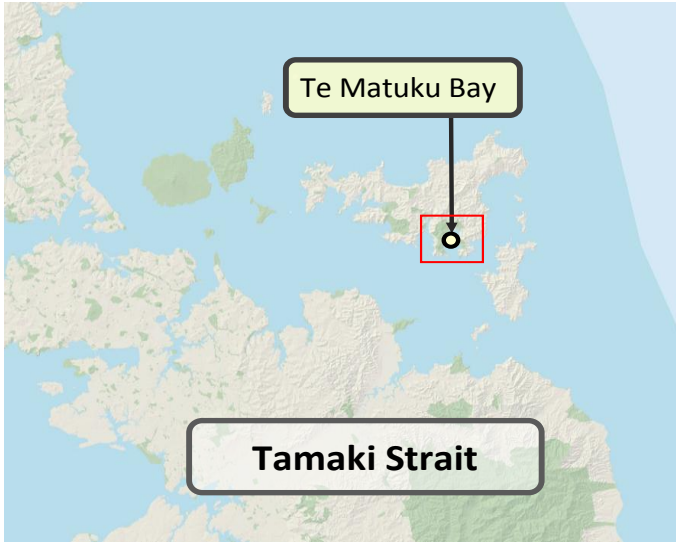
- <±1% per annum change probably indicates no (or very little) trend;
- ±1–2% per annum indicates a small, or emerging, trend. Changes of this magnitude could be largely associated with analytical and/or sampling variation, so trends in this range may not have any "real world" significance; and
- >±2% indicates a stronger trend, equivalent to > ±20 % per decade, which is probably worth investigating further to better understand possible causes.

Mud content is given as the % of the <500 µm fraction of the sediment that is <63 µm. Where this has been determined by more than one method in any year, the average of the values has been used.

Site Index

1.1 Te Matuku Bay (SoE)

Site	Type	Description & Notes
Te Matuku Bay	Sandy SZ	Site is located in the mid-to-upper reaches of Te Matuku Bay, Waiheke Island. Site is on a uniform sandflat close to low tide channel. The sediment here is firm, slightly muddy sand. Background reference site, as catchment is relatively undeveloped rural scrub & pasture. Te Matuku Bay is a marine reserve.
Reporting Area	**Land Use**	
Tamaki Strait	Rural scrub & pasture	



Additional Notes

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Site

Te Matuku, Waiheke Is. (SoE)

Reporting Area

Tamaki Strait

Description

Sandy SZ site.
Rural catchment.

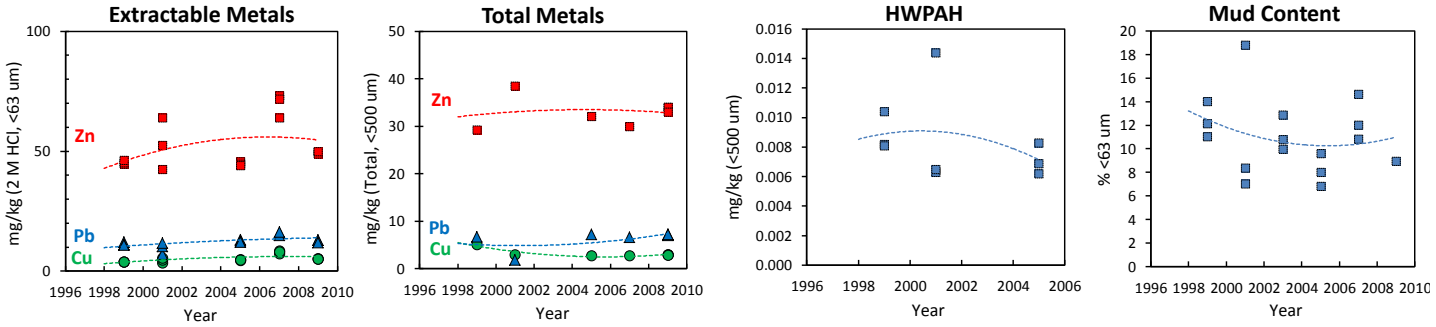
ERC Status

Cu | Pb | Zn | PAH

Trends & Comments

11 year monitoring period. No data for 2003. Extractable metals' variability may be due to analysis. Assess metals' trends from Total Metals. Current contaminant status - ERC Green. Overall, no major changes over time.

Changes in sediment chemistry over monitoring period. "Line of best fit" (quadratic smoothing) shown.



Annual median concentrations & indicative trends (by linear regression). Colours refer to ERC (see footnotes).

Year	Mud Content % <63 um	Organic Carbon TOC (%, <500 um)	Extractable Metals (mg/kg, <63 µm) Cu	Pb	Zn	Total Metals (mg/kg, <500 µm) Cu	Pb	Zn	HWPAH (mg/kg, <500 µm) mg/kg	at 1% TOC
1998	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data
1999	12.2	no data	4.0	11.2	45	5.1	6.7	29	0.008	no data
2001	8.4	no data	4.6	10.2	52	3.0	1.9	38	0.007	no data
2003	10.8	0.39	no data	no data	no data	no data	no data	no data	no data	no data
2005	8.0	0.36	4.6	12.7	45	2.8	7.2	32	0.007	0.019
2007	12.0	0.38	8.2	15.9	72	2.8	6.6	30	no data	no data
2009	8.9	no data	5.2	13.0	50	3.0	7.2	34	no data	no data
Median	10.8	0.37	4.9	12.2	49	3.0	7.0	33	0.008	0.019
Trend (absolute units per year)	-0.2	0.00	0.2	0.4	0.9	-0.1	0.3	0.0	0.000	no value
Trend (% of median per year)	-1.9	-0.7	4.7	2.9	1.9	-4.7	3.7	0.1	-4.0	no value

Environmental Response Criteria (ERC)

Cu <19 Pb <30 Zn <124 PAH <0.66 | Cu 19–34 Pb 30–50 Zn 124–150 PAH 0.66–1.7 | Cu >34 Pb >50 Zn >150 PAH >1.7

ERC: For Outer Zones - the greater of the <63 µm and <500 um fraction data. Settling Zones - the <500 µm fraction data

Trend Indicators

< ±1% | ±1 - 2% | > ±2%

Average annual rate of change, as % of median per year